

REMARKS

1. Status of Claims

Claims 2, 12, and 13 have been cancelled. Claims 1 and 16 have been amended. Claims 1, 3-11, and 14-18 remain for consideration.

2. Response to Anticipation Rejection of Claims 1, 5-7, and 9-12

The Examiner rejects claims 1, 5-7, and 9-12 as being anticipated by U.S. Pat. No. 5,475,073 ("073") under 35 U.S.C. §102(b). To overcome this rejection, Applicants have amended claim 1 by incorporating the limitation of claims 2, 12, and 13 into claim 1. Original claim 2 requires a total monomer conversion greater than about 90%. The combination of original claims 12 and 13 limits the allylic alcohol to allyl alkoxylates. These elements are clearly missing from the '073 patent, and thus amended claim 1 can no longer be anticipated by the reference.

Further, in the Office Action, the Examiner specifically points to Example 3 of the '073 patent. Applicants respectfully submit that Example 3 of the '073 patent, like the reference as a whole, does not anticipate amended claim 1 because it uses allyl alcohol and because it gives a total monomer conversion of 70% (i.e., 771.5 grams of monomers produces 540 grams of polymer), which is substantially lower than the claimed 90% conversion.

Claims 5-7 and 9-12 are not anticipated by the reference because they depend from claim 1.

3. Response to Obviousness Rejection of Claims 1-4, 8, and 13-18

The Examiner also rejects claims 1-4, 8, and 13-18 as being obvious over the '073 patent in view of U.S. Pat. No. 6,127,500 ("500") and further in view of Aldrich catalog.

Note that claims 1 and 16 are independent claims, claims 2-4, 8, and 13-15 depend from claim 1, and claims 17 and 18 depend from claim 16. Thus, Applicants would like to discuss two separate groups of claims, Group I: claims 1-4, 8, 13-15 and Group II: claims 16-18.

First, Applicants submit that Group I is not obvious over the combination of the references. As discussed above, amended claim 1 requires two additional elements: (1) the process gives a total monomer conversion greater than 90% and (2) allyl alcohol is excluded from the process. These two elements cannot be found from the '073 patent, the primary reference. Therefore, to establish a prima facie case of obviousness, the deficiency of the '073 patent must be remedied by the secondary references, the '500 patent or Aldrich catalog. However, neither the '500 patent nor Aldrich catalog provides any help.

As the Examiner recognizes, the '500 patent teaches that the resins made by the '073 patent are valuable reactive intermediates for high-performance coatings. However, the '500 patent does not provide any additional teaching concerning the claimed process. Similarly, Aldrich catalog, which lists the physical properties of raw materials, does not remedy the deficiency of the '073 patent. Hence, the combination of the cited references cannot render amended claim 1 obvious.

Applicants respectfully note that allyl monomers, unlike vinyl or acrylic monomers, are very difficult to polymerize. Allyl monomers are strong chain transfer agents which result in low molecular weight resins and low monomer conversions. One of ordinary skill in the polymer art would not have expected that copolymerizing an allyl alkoxylate with an acrylic monomer, except methyl acrylate or methacrylate, in the absence of styrene would dramatically increase the monomer conversion. The effect of styrene and methyl acrylate or methacrylate monomers on the monomer conversion of the claimed process is truly extraordinary. Similarly, no one in the polymer art would have expected the dramatic differences between allyl alcohol and allyl alkoxylate concerning their effect on the monomer conversion of the claimed process. Thus, amended claim 1 cannot be obvious over any references prior to Applicants' invention.

The remaining claims of Group I are not obvious because they depend from claim 1.

Second, Applicants respectfully contend that Group II is not obvious over the combined teachings of the cited references. Group II has the same

limitations as Group I: it requires greater than 90% of monomer conversion and uses allyl alkoxylate but not allyl alcohol. Therefore, for the same reason as stated for Group I, Group II is not obvious over the combined teachings of the references.

In addition, Group II further requires that the polymerization is conducted at reflux temperature. Applicants respectfully note that conventional process for allyl monomer polymerization is almost always conducted in a sealed reactor under pressure. See, e.g., the '073 and '500 patents. It has been believed that high reaction pressure might increase the monomer conversion of allyl polymerization. Contrary to this common belief, Applicants have found that a high monomer conversion can be achieved in an open reactor by refluxing if other conditions of the claimed process are met. Thus, conducting the claimed process at reflux temperature is not a simple process optimization. Rather, the resulting high monomer conversion is truly surprising.

In conclusion, Applicants' claims are novel and non-obvious. Accordingly, Applicants respectfully ask the Examiner to withdraw the rejections and to allow the claims. Attached hereto is a marked-up version of changes made to the claims by the current response. The attached page is captioned "Version with markings to show changes made." Applicants invite the Examiner to telephone their agent, Dr. Shao Guo, at (610) 359-6059 if a discussion of the application might be helpful.

Respectfully submitted,
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the claims:

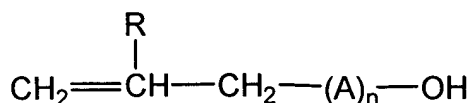
Claims 2 and 12 have been cancelled.

Claims 1 and 16 have been amended as follows:

1. (Amended) A process for making an acrylic polyol, said process being performed essentially in the absence of styrene, methyl acrylate and methyl methacrylate, and comprising:

- (a) initially charging a reactor with an allylic alcohol, 0-50% of the total amount to be used of a C₂-C₂₀ alkyl or aryl acrylate or methacrylate monomer and 0-100% of the total amount to be used of a free-radical initiator;
- (b) heating the reactor contents to a temperature within the range of 100-250°C; and
- (c) gradually adding to the reactor the remaining acrylic monomer and initiator;

wherein the allylic alcohol has the general structure:

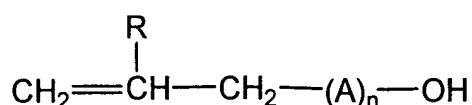


in which R is hydrogen, a C₁-C₁₀ alkyl, or a C₆-C₁₂ aryl group; A is an oxyalkylene group; and n, which is an average number of oxyalkylene groups, is within the range of 1 to about 15; and wherein the process gives a total monomer conversion greater than about 90%.

16. (Amended) A process for making an acrylic polyol, said process being performed at reflux temperature under atmospheric pressure, essentially in the absence of styrene, methyl acrylate and methyl methacrylate, and comprising:

- (a) initially charging a reactor with an allylic alcohol, 0-50% of the total amount to be used of C₂ to C₂₀ alkyl or aryl acrylate or methacrylate and 0-100% of the total amount to be used of a free-radical initiator;
- (b) heating the reactor contents to reflux ; and
- (c) gradually adding to the reactor the remaining acrylic monomer and initiator;

wherein the acrylic monomer has a boiling point the same as or higher than the allylic alcohol, wherein the allylic alcohol has the general structure:



in which R is hydrogen, a C₁-C₁₀ alkyl, or a C₆-C₁₂ aryl group; A is an oxyalkylene group; and n, which is an average number of oxyalkylene groups, is within the range of 1 to about 15; and wherein the process gives a total monomer conversion greater than about 90%.